

Capital Structure and the Redeployability of Tangible Assets*

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Abstract

We characterize a strong relation between asset tangibility and capital structure by exploiting variation in the salability of corporate assets. We do so using an instrumental variables approach that incorporates measures of supply and demand for different types of tangible assets (e.g., machines, land and buildings). Theory suggests that tangibility increases borrowing capacity because it allows creditors to more easily repossess a bankrupt firm's assets. Tangible assets, however, are often illiquid. Our study shows that the *redeployability* of tangible assets is a key determinant of firm leverage (beyond standard measures of tangibility). Consistent with a credit supply-side view of capital structure, we find that asset redeployability is a particularly important driver of leverage for firms that are more likely to face credit frictions (small, unrated, and low payout firms). Additional tests show that asset redeployability facilitates borrowing the most during periods of tight credit in the economy. Our findings are consistent with capital structure models of contract incompleteness and limited enforceability.

Key words: Asset tangibility, redeployability, capital structure, credit frictions, instrumental variables, asset demand.

JEL classification: G32.

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1 Introduction

Theory suggests that contract incompleteness and limited enforceability reduce a firm’s access to external finance (Hart and Moore (1994) and Holmstrom and Tirole (1997)). In the presence of contracting frictions, assets that are tangible are more desirable from the point of view of creditors because they are easier to repossess in bankruptcy states. Tangible assets, however, often lose value when they are reallocated (see Berger et al. (1996), Pulvino (1998), and Acharya et al. (2007)). Such losses imply that only those tangible assets that can be easily redeployed should sustain high debt capacity (see Shleifer and Vishny (1992)). Differently put, tangible assets should facilitate firm borrowing only to the extent that they are salable.¹

This paper gauges the impact of asset tangibility on capital structure by exploiting variation in the supply and demand for different types of corporate assets. Assets that are less firm-specific should allow for higher debt capacity because they are easier to resell (e.g., to other firms in the same industry). In addition, assets that respond to supply and demand forces in their secondary markets are likely to be more redeployable. Using these insights, we decompose the measure of asset tangibility commonly used in capital structure studies (“plant, property and equipment,” or PP&E) into its main components. We then assess variation in redeployability across those components by way of an instrumental approach that utilizes proxies for asset salability in secondary markets. Our study reports new findings on the relation between asset tangibility and firm capital structure, identifying when and how tangibility affects leverage. Consistent with the view that tangibility eases borrowing, we find that the redeployability of tangible assets is a particularly important driver of leverage for firms that are more likely to face credit frictions, especially during periods of tight credit in the economy.

Our analysis proceeds in several steps. We first study the economic relevance of asset tangibility relative to traditional demand-side determinants of leverage; motivated, for example, by pecking order, trade-off, and market timing arguments. Based on standard empirical tests, we find a strong positive relation between the commonplace proxy for tangibility (the ratio of PP&E to total assets) and firm leverage. Comparing variables on the basis of estimated economic impact, we find that asset tangibility is one of the single most important drivers of leverage. We then examine the relative importance of the various components of tangibility. This examination entails breaking down fixed assets into its identifiable parts, which include land and buildings, machines and equipment, and other miscellaneous assets. Notably, we look for variation coming from the *redeployability* of those different assets using an instrumental variables approach that is helpful in dealing with simultaneity between tangibility and leverage.

¹Relatedly, Ortiz-Molina and Phillips (2010) argue that asset liquidity lowers a firm’s implied cost of capital.

We combine three different sets of instruments in our tests. The first set comprises industry proxies capturing information on firms’ use of land and buildings, machinery, and other tangible assets. This set is motivated by the product-market literature, which prescribes a technology-driven level and mix of fixed assets usage that varies across industries (see, e.g., Maksimovic and Zechner (1991) and Williams (1995)). Our second set of instruments speaks to the salability of land and buildings owned by firms. The instruments in this set capture drivers of supply and demand conditions of the real estate markets where firms operate, including proxies for the number of real estate operators in the areas firms are headquartered, the local disposal of real estate assets by the federal Government (the largest real estate supplier in the U.S.), as well as the pricing and volatility of local rental rates (see Sinai and Souleles (2005) and Ortalo-Magne and Rady (2002)). The third set of instruments relates to the liquidity of the market for machinery and equipment and includes proxies for the volume of transactions of second-hand machinery and equipment in the industries our sample firms operate. It also includes information on workforce, which influences capital/labor ratios, hence the demand for hard assets (MacKay and Phillips (2005), Campello (2006), and Garmaise (2008)). Sources of data for these instruments range from standard COMPUSTAT, to the SNL real estate database, to authors’ filings of information requests under the Freedom of Information Act.

Our experiment shows that tangible assets drive observed capital structure to the extent that they are redeployable: it is the component of asset tangibility which relates to salability that explains firm leverage. In addition, across the various categories of tangible assets, we find that land and buildings — arguably, the least firm-specific fixed assets — have the most explanatory power over leverage.² The results we report are consistent with the idea that frictions such as contract incompleteness and limited enforceability are key determinants of capital structure. As we discuss below, while prior literature has considered the idea that these kinds of financing imperfections are relevant, we show that they have first-order effects on corporate leverage.

To help characterize our inferences about corporate assets and credit, we contrast firms that are more likely to face credit frictions (small, unrated, and low dividend payout firms) and firms that are less likely to face those frictions (large, rated, and high dividend payout firms). We find that our redeployability–leverage results are very pronounced across the set of constrained firms — firms for which collateral recourse is particularly important in the borrowing process. For example, our small-firm estimates imply that a one-interquartile range change in redeployability is associated with a 41% increase in market leverage. This is equiv-

²Our results suggest that other tangible asset categories, such as machines and equipment, have insignificant explanatory power over leverage.

alent to a sharp shift in market leverage from its mean of 22% to about 31%. In contrast, for unconstrained firms, redeployability is an irrelevant driver of leverage. These cross-sectional contrasts are consistent with the financing friction argument: variation in asset redeployability only affects the borrowing capacity of credit-constrained firms.

Prior literature shows that the extent to which credit frictions bind and influence firm behavior is often a function of the state of the economy (see, among others, Gertler and Gilchrist (1994) and Bernanke and Gertler (1995)). This observation points to time-series variation that can be exploited to further flesh out our redeployability–leverage story. In additional tests, we show that the role for redeployability in alleviating financing frictions is heightened during episodes of tight credit. In particular, we estimate that a one-percentage point increase in the Fed funds rate (a proxy for credit tightening) leads to a 40% increase in the sensitivity of leverage to asset redeployability. Consistent with a supply-side view of capital structure, these macro-type tests further imply that asset tangibility increases debt capacity by ameliorating frictions in the market for corporate borrowing.³

Our evidence points to asset tangibility as a key driver of leverage. It is important that we put these findings in context with recent literature that more closely relates to our paper. Faulkender and Petersen (2006) find that firms with credit ratings (a proxy for access to the public debt markets) have higher leverage. Both papers are complementary in that they explore different sources of data variation to provide evidence of a supply-side view of capital structure. Notably, we find that the economic effect of redeployability on leverage is likely to be larger than that of ratings, suggesting that supply-side determinants of capital structure might be stronger than previously thought. The more substantive contribution of our study relative to theirs is that, rather than using a broad measure of access to credit (one that summarizes different aspects of financial contracting), we identify a specific channel through which contracting imperfections (the liquidity of collateral recourse) affect capital structure.

We also experiment with Lemmon et al.’s (2008) leverage model to check whether our inferences about asset tangibility pass those authors’ “fixed-effects stress tests.” Lemmon et al. show that traditional determinants of leverage become largely irrelevant once the econometrician accounts for time-invariant firm effects. Like those authors, we find a pattern of decline in the regression coefficients of traditional determinants of leverage after we account for firm effects. The coefficients associated with our tangibility proxies are notable exceptions, nonetheless. Relative to the baseline OLS model of Lemmon et al., the effect of land and build-

³Korajczyk and Levy (2003) report that the leverage ratios of financially constrained firms are more sensitive to aggregate demand shocks. The authors, however, do not establish a link between this empirical regularity and any particular feature of financial contracting or type of credit imperfection.

ings on leverage increases by a factor of almost 3 in firm-fixed effects instrumental variables estimations. Our inferences also survive the inclusion of “initial leverage” in the regression specification (following Lemmon et al.). In all, these experiments highlight the robustness of the redeployability–leverage channel we propose.

Our paper adds to current research on capital structure by considering credit supply-side frictions as determinants of leverage. A few recent papers have explored related ideas. Benmelech (2009) uses variation in the width of the track gauges used by 19th century railroad companies to measure asset salability. Empirically, he finds that firms using track gauges that are easier to sell (to other railroad companies) use more long-term debt. Benmelech, however, finds less conclusive evidence on the impact of asset salability on leverage ratios. Using data from the airline industry, Benmelech and Bergman (2009) find that debt tranches secured by more liquid collateral pay lower interest rates and sustain higher loan-to-value ratios.⁴ Exploring the introduction of certificates of deposits, Leary (2009) shows that shocks to the supply of bank lending affected corporate leverage in the 1960s. Lemmon and Roberts (2009) use a natural experiment (the 1989 collapse of the junk bond market) to study the effect of a supply-side credit shock on the financing and investment of junk bond issuers. The authors do not find an effect of credit supply on leverage. Our paper contributes to this literature by providing systematic evidence (across firms, time, and industries) of first-order effects of credit supply on capital structure. Our study uniquely pins down a well-defined channel — the redeployability of tangible assets — in identifying an important way in which credit imperfections affect leverage ratios.⁵

The remainder of the paper is organized as follows. The next section describes the data and compares our sample to those of standard capital structure studies. Section 3 presents our central results on the effect asset tangibility (and its various components) on capital structure. Section 4 presents results for partitions of firms facing various degrees of financing frictions, and during periods of tight credit in the aggregate economy. Section 5 compares the impact of asset tangibility with that of other leverage determinants discussed in recent studies. Section 6 concludes the paper.

⁴Benmelech et al. (2005) find a positive relation between the liquidation value of commercial real estate and the size of mortgage contracts.

⁵In contemporary work, Rampini and Viswanathan (2010) report evidence of positive correlation between fixed assets (PP&E) and leverage. Similar to early papers in the literature, however, those authors do not look at the redeployability of tangible assets, do not differentiate between different types of tangible assets, nor account for the endogeneity of tangibility.

2 Base Analysis

2.1 Sampling and Variable Construction

Our sample consists of active and inactive firms from COMPUSTAT with main operations in the U.S. for the years between 1984 and 1996. We focus on that time window because one of our goals is to gauge the relative importance of the different components of firms' property, plant and equipment, and COMPUSTAT does not report that decomposition in other years. The raw sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. We exclude firm-years for which the value of total assets or net sales is less than \$1 million. We drop observations if total tangible assets or any of its partitions are larger than 100% of total assets. We further exclude firm-years observing an increase in size or sales of more than 100% or for which market-to-books ratio are greater than 10. Similarly, we exclude firms involved in major restructuring, bankruptcy, or merger activities.

We combine the COMPUSTAT data with several data sources. We do this in order to implement an instrumental variable approach that deals with the endogeneity of tangibility. We model the endogeneity of asset tangibility as a function of industry characteristics, real estate market conditions, and the structure and liquidity of the secondary market for machinery and equipment. To streamline the discussion, we dedicate the remainder of this section to describing sample statistics, variable construction, and regression models that are commonly found in the existing literature. We describe our instruments in the following section.

The basic left-hand side variable of the models we estimate in this study is market leverage. Following the literature, *MarketLeverage* is the ratio of total debt (COMPUSTAT's items $dltt + dlc$) to market value of total assets, or $(at - ceq + (prcc_f \times cshpri))$. In every estimation performed, we also look at book values of debt, where we compute *BookLeverage* as the ratio of total debt to book value of total assets (at). The drivers of leverage that we examine are also standard, coming from an intersection of papers written on the topic in the last two decades.⁶ *Size* is the natural logarithm of the market value of total assets (measured in millions of 1996 dollars). *Profitability* is the ratio of income before interest, taxes, depreciation and amortization ($oibdp$) to book value of total assets. Q is the ratio of market value of total assets to book value of total assets. *Earnings Volatility* is the ratio of the standard deviation of income before interest, taxes, depreciation and amortization to book assets, computed from four-year windows of consecutive firm observations. *MarginalTaxRate* is Graham's (2000) marginal tax rate, available from John

⁶The literature we follow in our variable selection process includes Barclay and Smith (1995), Rajan and Zingales (1995), Graham (2000), Baker and Wurgler (2002), Frank and Goyal (2003), Korajczyk and Levy (2003), Campello (2006), Faulkender and Petersen (2006), Flannery and Rangan (2006), and Lemmon et al. (2008).

Graham’s website. *RatingDummy* is a dummy variable that takes a value of 1 if the firm has either a bond rating (*splticrm*) or a commercial paper rating (*spsticrm*), and zero otherwise.

Our focus is on asset tangibility and its components. We denote the usual measure of asset tangibility by *OverallTangibility*, which is defined as the ratio of total tangible assets (*ppent*; or “PP&E”) to book value of total assets. *Land&Building* is the ratio of net book value of land and building (*ppenli* + *ppenb*) to the book value of total assets. *Machinery&Equipment* is the ratio of net book value of machinery and equipment (*ppenme*) to book value of total assets. *OtherTangibles* is the ratio of plant and equipment in progress and miscellaneous tangible assets (*ppenc* + *ppeno*) to book value of total assets.

2.2 Descriptive Statistics

Table 1 presents the descriptive statistics of our data. Our sampling methods and variable construction approach are similar to those used in existing capital structure studies and, not surprisingly, the associated descriptive statistics mimic those of existing papers. Faulkender and Petersen (2006), for example, report average market and book leverage of, respectively, 19.9% and 26.1%. This is very similar to the corresponding averages of 20.2% and 25.7% that we find for our sample. Similarly, the average *OverallTangibility* of 35.6% that we report is comparable to the average of 34% reported in the Lemmon et al. (2008) and Frank and Goyal (2003) studies; or the 33.1% reported by Faulkender and Petersen.

A novel feature of our study is the decomposition of asset tangibility. Table 1 shows that *Land&Building* and *Machinery&Equipment* are both key components of *OverallTangibility*. These items are also quite relevant in terms of the total asset base of the firms in COMPUS-TAT. The mean (median) ratio of *Land&Building* to total assets is equal to 11.8% (10.2%). For *Machinery&Equipment* the mean (median) ratio is 18.9% (16.1%). In contrast, *OtherTangibles* accounts for only 1.5% of total assets.

TABLE 1 ABOUT HERE

2.3 Standard Leverage Regressions

We check that our sample is representative of previous capital structure studies by running “standard leverage regressions” for both the 1984–1996 window (which we use due to data availability) and a larger 1971–2006 window (more standard). Similar to previous studies, we estimate a benchmark regression model for *Leverage* (either market or book values) of the form:

$$Leverage_{i,t} = c + \alpha OverallTangibility_{i,t} + \beta \mathbf{X}_{i,t} + \sum_i Firm_i + \sum_t Year_t + \varepsilon_{i,t}, \quad (1)$$

where the index i denotes a firm, the t denotes a year, c is a constant, and \mathbf{X} is a matrix containing the standard control variables just described (*Size*, Q , *Profitability*, etc.). *Firm* and *Year* absorb firm- and time-specific effects, respectively. Our current focus is on the importance and robustness of the coefficients returned for *OverallTangibility*. We will use these estimates as a benchmark case in the tests conducted subsequently in the paper.⁷ All of our regressions are estimated with heteroskedasticity-consistent errors clustered by firm (Rogers (1993)).

The results are reported in Table 2. The standard leverage regression (Eq. (1)) is estimated four times, considering different combinations for the definition of leverage (*MarketLeverage* vs. *BookLeverage*) and the sample period used (1984–1996 vs. 1971–2006). For our purposes, a key result from Table 2 is that the coefficient returned for *OverallTangibility* is of similar magnitude across the 1984–1996 and 1971–2006 windows. They are also similar to those reported in prior studies (e.g., Frank and Goyal (2003)). For the *MarketLeverage* model, we find that the coefficient on *OverallTangibility* is 0.210 in the 1984–1996 baseline sample, compared to 0.220 in the 1971–2006 extended sample. These estimates are economically and statistically indistinguishable from each other. Inferences are similar for *BookLeverage*. The magnitudes of the coefficients associated with the other regressors are also generally similar across samples. To avoid repetition, we discuss the coefficients of the other regressors in further detail in the tests performed in the next section.

TABLE 2 ABOUT HERE

3 Main Results

3.1 The Components of Asset Tangibility

We investigate whether redeployability of a firm’s assets is a first-order determinant of observed dispersion in capital structure. We first focus on the commonplace measure of asset tangibility, which we call *OverallTangibility*. We then partition this measure into its identifiable components from COMPUSTAT (*Land&Building*, *Machinery&Equipment*, and *OtherTangibles*) under an instrumental variables approach that considers the redeployability of each of these components. In the next section, we discuss univariate evidence on the relation between asset tangibility, including its different components, and leverage. Multivariate evidence is later discussed.

⁷Our inferences are the same whether or not we lag the right-hand side variables of Eq. (1).

3.1.1 Leverage and Asset Tangibility: Univariate Analysis

We start out by presenting univariate evidence on how leverage varies with overall asset tangibility, and across the different components of tangibility. Table 3 presents mean comparison tests of leverage for subsamples of firms in the bottom and top quartiles of the distribution of *OverallTangibility* (alternatively, *Land&Building*, *Machinery&Equipment*, and *OtherTangibles*). We note that this detailed analysis has not been presented in the literature.⁸

The evidence in Table 3 suggests that asset tangibility and leverage are related, and this relation varies across the different components of tangible assets. The first row of Panel A shows that going from the bottom to the top quartile of the distribution of *OverallTangibility* is associated with an increase in market leverage of 50% (from 16% to 24%). For book leverage (Panel B), the increase associated with an equivalent change in *OverallTangibility* is 43% (from 21% to 30%). Similarly, going from the bottom to the top quartile of the distribution for *Land&Building* implies an increase in market leverage of 33%. The increase in leverage associated with a bottom-to-top quartile change in *Machinery&Equipment* is considerably lower, only 20%. The patterns that are associated with *Land&Building* and *Machinery&Equipment* are similar when we look at book leverage. These cross-sectional differences are all highly statistically significant. The evidence is less clear-cut for *OtherTangibles*. In fact, firms in the bottom quartile of the distribution for *OtherTangibles* tend to have higher (not higher) leverage.

TABLE 3 ABOUT HERE

The univariate evidence suggests that asset tangibility and leverage are positively correlated, and that this correlation might be stronger for certain types of tangible assets, such as land and buildings. Naturally, the evidence in Table 3 does not allow us to see whether this relation is confounded with other sources of firm heterogeneity. Moreover, it does not allow us to assess the economic importance of asset tangibility relative to other determinants of leverage. The next section deals with these issues.

3.1.2 Leverage Regression: Unrestricted Model

The estimation of Eq. (1) restricts the coefficient on the different components of asset tangibility to a single estimate. We refer to that equation as “restricted model.” In this section, we re-estimate Eq. (1) under different approaches, but alternatively also allow the different components of asset tangibility to attract individual coefficients. We call this alternative model the

⁸Rampini and Viswanathan (2010) report a positive relation between fixed assets (PP&E) and leverage, but the authors do not look at different components of those tangible assets.

“unrestricted model.” Our unrestricted tangibility model of leverage can be written as follows:

$$\begin{aligned} Leverage_{i,t} = & c + \alpha_1 Land\&Building_{i,t} + \alpha_2 Machinery\&Equipment_{i,t} + \alpha_3 OtherTangibles_{i,t} \\ & + \beta \mathbf{X}_{i,t} + \sum_i Firm_i + \sum_t Year_t + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where *Leverage*, *c*, and \mathbf{X} are defined similarly to Eq. (1), with *Firm* and *Year* absorbing firm- and time-specific effects, respectively.

The standard approach to the estimation of Eq. (2) is the OLS model. However, one should be concerned with the potential for endogenous biases in this estimation. While the tangibility of a firm’s assets — the type and mix of assets it uses — might be determined by the line of business it operates, one can argue that the firm ultimately makes marginal decisions regarding the proportion of inputs it employs in its production process (e.g., different combinations of land, machinery, labor, and intangibles), making observed asset tangibility an *endogenous* variable. In turn, we look for variation coming from the redeployability of different components of tangible assets using an instrumental variables approach that is helpful in dealing with potential endogeneity between tangibility and leverage.

3.2 An Instrumental Variables Approach

The remainder of our analysis will focus on inferences based on instrumental variables (IV) approaches to modeling the relation between a firm’s capital structure and the various components of its tangible assets.⁹ The issue of endogeneity of tangibility has not been previously addressed in the empirical capital structure literature. This task is challenging due to the degree of heterogeneity that is engendered in the traditional measure of tangibility, which includes assets as diverse as land and machines in progress. Econometrically, this implies finding valid instruments for each of the identifiable types of tangible assets. We experiment with multiple sets of instruments, which we describe in turn.

3.2.1 Instrumental Sets

Our first set of instruments includes 4-digit SIC industry-year averages for *Land&Building*, *Machinery&Equipment*, and *OtherTangibles*. The motivation is that industry-specific characteristics are thought to play a central role in determining the level and mix of tangible assets used by a firm. Theoretically, the argument that a firm’s financial and real decisions are linked to the industry where the firm operates is grounded on the product-market literature (see, e.g.,

⁹For completeness and comparability, however, we also report results from standard OLS models.

Maksimovic and Zechner (1991), Williams (1995), and Fries et al. (1997)). Evidence of these links is presented in MacKay and Phillips (2005) and Campello (2006).

Our second set of instruments captures drivers of demand and supply conditions in the real estate markets where our sample firms' headquarters are located. The rationale for these instruments is that firms operating in real estate markets where office buildings and production facilities are readily available will need to keep less of these facilities in their balance sheets, leasing or renting them instead (see Sinai and Souleles (2005) and Ortalo-Magne and Rady (2002) for evidence in the real estate literature). We use leasing expenses (COMPUSTAT's *xrent/sale*) as a proxy for the firm's leasing decision of real estate facilities. Additionally, we proxy for the supply of real estate facilities using the natural logarithm of the number of Real Estate Investment Trusts (REITs) and other real estate firms operating in the firm's headquarter state as reported in the SNL Datasource database. We also include the state-level Herfindahl Index for commercial bank concentration since bank concentration is known to affect the availability of real state loans. Finally, we include in the instrument set the average rental volatility of commercial real estate lessors operating in the firm's state (measured over 4-year windows). Sinai and Souleles (2005) show that real estate ownership increases with rental volatility because ownership provides an insurance against fluctuations in rental rates.

Our third set of instruments looks at the market for machinery and equipment. Prior literature argues that manufacture structure (machinery and equipment) and labor configuration are related decisions (see MacKay and Phillips (2005) and Garmaise (2008) for recent evidence). Following Garmaise, we use the ratio of number of employees to costs of good sold as an instrument for asset tangibility. While firms may choose differently between capital and labor, depending on considerations such as financing constraints, one might expect these two quantities to be moving in the same direction along the firm's investment expansion path. Our second instrument in this set considers the liquidity of machinery and equipment within the industry where the firm operates. Firms operating in industries with an active secondary market for their machinery and equipment will be more likely to carry those assets at a lower cost in their balance sheets (Almeida and Campello (2007)). In particular, since those assets can be easily found in the secondary market, they need not be built (custom made) for the firm. Instead, they can be bought as used goods and integrated in the firm's production process at a lower user cost. Following Schlingemann et al. (2002), we use the 4-digit SIC industry-year ratios of sales of property, plant and equipment to the sum of sales of property, plant and equipment and capital expenditures (i.e., COMPUSTAT's $spe/(spe + capx)$) as a proxy for the liquidity of machinery and equipment in the industry a firm operates.¹⁰

¹⁰A related, coarser measure is used by Sibilkov (2009), who estimates OLS regressions of leverage on an

3.2.2 First-Stage Results and Instrument Quality Assessment

It is important that we verify the validity and relevance of our proposed instruments. Test statistics that speak to these properties are reported in Table 4. The table displays the slope coefficients returned from four different first-stage regressions that feature, alternatively, *OverallTangibility*, *Land&Building*, *Machinery&Equipment*, and *OtherTangibles* as the dependent (endogenous) variable. The instruments we consider deliver results that agree with common priors. For example, proxies for leasing expenses and the supply of rentable real estate in a firm’s headquarter location load negatively on the firm’s propensity to acquire land and buildings. Likewise, liquidity in the market for machinery and equipment leads firms to carry less of those assets in their balance sheets, while the ratio of employees to cost of goods sold is positively associated with the demand for capital. At the same time, some of the instruments we include based on our priors prove to have somewhat lower (individual) explanatory power ex-post. It is therefore important that we examine the relevance of our instrumental set.

The first statistic we consider in this examination is Shea’s Partial R^2 (Shea (1997)). Shea’s R^2 measures the overall relevance of the instruments for the case of multiple endogenous variables after accounting for their correlation. Table 4 shows that the Shea’s R^2 ’s associated with our instruments are relatively large for panel tests of the type we conduct, in the range of 5.6% to 7.9%.¹¹ We also conduct first-stage exclusion F -tests for our set of instruments and the associated p -values for those tests are all much lower than 1% (confirming the explanatory power of our instruments). One potential concern with the first-stage F -test in the case of multiple endogenous regressors is that it might have associated low p -values for all first-stage regressions even if only one valid instrument is available (see Stock and Yogo (2005)). To address this issue, we conduct the *Kleibergen-Paap* test for weak identification (Kleibergen and Paap (2006)). In the case of multiple endogenous variables, this is a test of the maximal IV bias that is possibly caused by weak instruments. For the unrestricted model, the *Kleibergen-Paap* F -test statistic is 10.9. Since the corresponding Stock and Yogo critical value for a maximal IV bias of 10% is 9.4, the maximal bias of our IV estimations will be below 10%.¹² In all, these

industry-level index of firm liquidity. Among other considerations, his approach is different from ours in that we study the liquidity of tangible, collateralizable assets, while his evidence concerns all assets of a firm (including intangible, unpledgeable ones).

¹¹Notably, the simple Partial R^2 ’s are, respectively, 6.7% for the *Land&Building* model and 8.3% for *Machinery&Equipment*. Baum et al. (2003) recommend as a rule of thumb that if the Shea’s Partial R^2 and the simple Partial R^2 are of similar magnitude, then one can infer that instruments used in the identification have adequate explanatory power. Our instruments perform well under that metric.

¹²Following Stock and Yogo, for further robustness, we re-estimate our models using the Limited Information Maximum Likelihood (LIML) estimator and the Fuller’s modified LIML estimator, which are both robust to weak instruments. Our results are not affected when we use these maximum likelihood estimators.

various checks imply that our results seem robust to concerns about weak instruments.

We have also explored the relevance of several other instruments. For example, we checked whether a proxy for sale activities of real estate assets by the Federal Government (the largest real estate “supplier” in the U.S.) should enter our first stage regressions. Our prior was that firms operating in those states with significant disposition activities would hold less land and buildings in their balance sheets. We needed to file a request under the Freedom of Information Act to obtain data on Government dealings with real estate assets. The variable turned out to have little statistical power ex-post. Similarly, proxies for real estate performance and the volume of commercial mortgage-backed securities linked to real estate assets located in the sample firms’ states did not prove to have explanatory power. Econometric theory suggests that many (weak) instruments will bias the IV estimator. In particular, the inclusion of many weak instruments exacerbates this bias and produces misleadingly small standard errors.¹³ Accordingly, we have used parsimony in the selection of the final instrumental set.

Finally, we also examine the validity of the exclusion restrictions associated with our set of instruments. We do this using Hansen’s (1982) J -test statistic for overidentifying restrictions.¹⁴ The p -values associated with Hansen’s test statistic are reported in the last row of Table 4. The high p -values reported in the table imply the acceptance of the null hypothesis that the identification restrictions that justify the instruments chosen are met in the data. Specifically, these reported statistics suggest that we do not reject the joint null hypotheses that our instruments are uncorrelated with the error term in the leverage regression and the model is well-specified.

TABLE 4 ABOUT HERE

3.2.3 Second-Stage Results

Restricted Model Second-stage coefficients for the restricted model (which includes only *OverallTangibility*) are presented in Table 5. We first discuss the statistical properties of these estimates (economic magnitudes are discussed shortly). We start by noting that *OverallTangibility* enters the *MarketLeverage* and *BookLeverage* regressions with a positive, highly statistically significant sign. Turning to the control variables, they also enter the regressions with the expected signs. *Size* enters the leverage regressions with the expected positive sign, although statistically insignificant. *Profitability* has a strong negative effect on leverage, a result that is commonly associated with Myers’s (1984) pecking order story. The coefficient on Q obtains

¹³See, e.g., Wooldridge (2002), Arellano (2003), and Hayashi (2000).

¹⁴In practice, the Hansen’s J -test statistic is a test of whether the residuals from the leverage regression are uncorrelated with the instruments (cf. Wooldridge (2002)). Accordingly, we have only one Hansen’s J -test statistic even in the case of multiple endogenous variables in our “unrestricted model.”

the expected negative sign, a finding often seen as consistent with the predictions in Myers (1977) and Hart (1993) that firms with significant growth opportunities use less debt to avoid underinvestment. Cash flow volatility may increase the costs of financial distress. Accordingly, *EarningsVolatility* enters the leverage regressions with the expected negative sign, though statistically insignificant. Firms with a high marginal tax rate should increase leverage to shield their tax burden. Contrary to this prediction, the *MarginalTaxRate* variable enters the leverage regressions with a negative coefficient, a finding that is similarly reported by Faulkender and Petersen (2006). Consistent with Faulkender and Petersen’s argument that firms with access to the public debt market are less opaque and can borrow more, we find that our bond market access indicator (*RatingDummy*) enters all regressions with a positively significant coefficient.

TABLE 5 ABOUT HERE

The economic effects of *OverallTangibility* and the other standard regressors on leverage are reported in square brackets in Table 5. These effects are displayed in terms of percentage change in leverage relative to its sample mean as each continuous regressor increases from the 25th to the 75th percentile (one interquartile range (IQR) change), while all other variables are kept at their sample mean. The existing literature has paid little attention to the relative economic importance of the various forces driving observed capital structure, focusing instead on their statistical significance. This makes our exercise particularly interesting. At the same time, we are cautious about the interpretation of these results since estimates are derived from reduced-form-type equations.

Taken at face value, the results in Table 5 imply that *OverallTangibility* is the single most important economic determinant of *MarketLeverage*. For example, a one-IQR change in *OverallTangibility* induces *MarketLeverage* to increase by 0.051, which is a 25.3% increase relative to the sample mean leverage of 0.202. In this regression, the coefficient for *Q* implies a sizeable effect, but this is about only two-thirds of the economic impact of tangibility on leverage under the experimental design we consider.¹⁵ Other important variables such as *Size* and *Profitability* are shown to have very limited economic impact on *MarketLeverage*. For the *BookLeverage* regressions, *OverallTangibility* is the most important driver of leverage, but its economic significance is comparable to that of *Size*, which, in contrast, is not statistically significant.

¹⁵We also considered experiments where we perturb the variable of interest with shifts measured in terms of standard deviations. Because some variables are highly skewed (such as *Q*), this purely parametric approach could lead us to conclude that those variables have disproportionately larger economic effects. As it turns out, however, our conclusions also hold when we consider standard deviation shifts in our experimental design.

Unrestricted Model Our empirical analysis allows for the fact that corporate assets differ in their degree of redeployability. Assets such as land and buildings are generally more easily redeployable than machinery and equipment because they have a lower level of firm specificity. Accordingly, we expect that among those assets that might be seen as tangible, land and buildings should be particularly helpful in easing contracting frictions between lenders and borrowers. This dimension has not been examined in the existing empirical literature. We are able to do so by decomposing the standard measure of asset tangibility (*OverallTangibility*) into various components: *Land&Building*, *Machinery&Equipment*, and *OtherTangibles*. With this decomposition, we can re-estimate the models of Table 5, then assess the economic significance of individual components of a firm’s tangible assets.

The results from our asset decomposition analysis are reported in Table 6. To highlight the role played by redeployability, we present estimates of Eq. (2) that are obtained from standard least squares (OLS), OLS with fixed effects (FE), and instrumental variables with fixed effects (IV). Focusing on the IV specification, *Land&Building* stands out as the single most important economic determinant of leverage (either book- or market-based measures). In the *MarketLeverage* model, a one-IQR change in *Land&Building* is associated with an increase of 30.3% in the firm’s leverage. This is almost twice as high as the economic effect of Q (which is 17.0%) and multiple times larger than any other traditional determinant of leverage. These contrasts are even sharper in the *BookLeverage* specification. In that model, a one-IQR change in *Land&Building* causes leverage to increase by 20.1%. This is about six-fold the economic effect of traditional drivers of capital structure, such as *Profitability* and Q . The only regressor in the *BookLeverage* model that has comparable economic magnitude is *Size*, which is not statistically significant.

TABLE 6 ABOUT HERE

In sum, for either definition of leverage (market or book leverage) and under alternative estimation approaches (OLS, FE, or IV), we find evidence pointing to land and buildings — presumably, the least firm-specific, most redeployable assets — as a first-order driver of leverage. Estimates for the other components of tangibility imply smaller economic effects and are statistically weak. Importantly, as highlighted in the comparisons between the IV model and the other least square-based approaches, it is the component of land and buildings that responds to redeployability in secondary markets that explains the observed dispersion in corporate leverage. Simply put, our evidence suggests that tangible assets enable firms to sustain higher borrowing capacity, but only to the extent that those assets are redeployable.

4 Credit Frictions and Macroeconomic Movements

The evidence thus far supports the argument that tangible asset redeployability affects leverage ratios. Taking this argument to its next logical steps, in this section we first contrast firms that are more likely to face financing frictions — for which asset collateral should be particularly important in raising debt finance — with firms that are less likely to face those problems. In a second set of experiments, we examine whether assets such as land and buildings become particularly stronger drivers of leverage during those times when financing frictions are likely to be heightened, such as periods of aggregate credit contraction. These tests are described in turn.

4.1 Cross-Sectional Variation in Credit Constraints and Leverage

We investigate whether asset tangibility is a particularly important driver of leverage for those firms that are more likely to face financial constraints. The first step in this examination is to sort firms into “financially constrained” and “financially unconstrained” categories. The literature offers a number of plausible approaches to this sorting. Since we do not have strong priors about which approach is best, we use a variety of alternative schemes to partition our sample:

- Scheme #1: We rank firms based on their asset size over the 1984 to 1996 period, and assign to the financially constrained (unconstrained) group those firms in the bottom (top) three deciles of the size distribution. The rankings are performed on an annual basis. This approach resembles that of Gilchrist and Himmelberg (1995), who also distinguish between groups of financially constrained and unconstrained firms on the basis of size. Fama and French (2002) and Frank and Goyal (2003) also associate firm size with the degree of external financing frictions. The argument for size as a good observable measure of financial constraints is that small firms are typically young, less well known, and thus more vulnerable to credit imperfections.
- Scheme #2: We retrieve data on firms’ bond ratings and classify those firms without a rating for their public debt as financially constrained. Given that unconstrained firms may choose not to use debt financing and hence not obtain a debt rating, we only assign to the constrained subsample those firm-years that both lack a rating and report positive long-term debt (see Faulkender and Petersen (2006)).¹⁶ Financially unconstrained firms are those whose bonds have been rated. Related approaches for characterizing financial constraints are used by Gilchrist and Himmelberg (1995) and Almeida et al. (2004).

¹⁶Firms with no bond rating and no debt are excluded, but our results are not affected if we treat these firms as either constrained or unconstrained. In robustness checks, we restrict the sample to the period where firms’ bond ratings are observed every year (from 1984 to 1996), allowing firms to migrate across constraint categories.

- Scheme #3: In every year over the 1984 to 1996 period, we rank firms based on their payout ratio and assign to the financially constrained (unconstrained) group those firms in the bottom (top) three deciles of the annual payout distribution. We compute the payout ratio as the ratio of total distributions (dividends and repurchases) to operating income. The intuition that financially constrained firms have significantly lower payout ratios follows from Fazzari et al. (1988), among others, in the financial constraints literature. In the capital structure literature, Fama and French (2002) use payout ratios as a measure of difficulties firms may face in assessing the financial markets.

Table 7 reports second-stage IV estimation results for our three financing friction partition schemes. For the three subsamples of constrained firms (small, unrated, and low dividend payout firms), *Land&Building* appears as the main first-order driver of capital structure. Panel A, for example, shows that a one-IQR change in *Land&Building* is associated with a 41.2% increase in *MarketLeverage* for the small firm partition. This is equivalent to a shift in market leverage from its mean of about 22% to nearly 31%. In contrast, other categories of tangible assets (*Machinery&Equipment* and *OtherTangibles*) allow for less debt financing. Their economic effect is smaller and statistically insignificant. Similarly, other determinants of leverage have small economic effects compared to *Land&Building*. For example, within the same small firm partition, a one-IQR change in *Q* is associated with a negative 12.9% change in *MarketLeverage*. This is less than one-third of the effect of *Land&Building*. Most of the other factors have negligible economic importance and sometimes attract the “wrong” sign in explaining capital structure variation across small firms. We reach very similar conclusions for the other financially constrained firm partitions (unrated and low dividend payout firms).

In contrast to the above results, asset tangibility does not seem to affect debt contracting across unconstrained firms (large, rated, and high payout firms). The tangibility proxies enter the market leverage regressions with generally negative, statistically insignificant coefficients. These contrasting results imply that *only* constrained firms have their observed capital structure dispersion explained by credit supply-side considerations (creditworthiness based on redeployable collateral).

Panel B reports regressions featuring *BookLeverage* as the dependent variable. In these regressions, *Land&Building* more sharply dominates other traditional determinants of leverage. For instance, for the small firm partition, a one-IQR change in *Land&Building* leads *BookLeverage* to increase by about 29% from its mean. By contrast, the economic effects of *Size*, *Profitability*, and *Q* are negligible. One reaches similar conclusions examining the unrated and

low payout firm partitions.

TABLE 7 ABOUT HERE

It is worthwhile discussing the results of Table 7. The estimates in the table imply that *Land&Building* is the most important economic determinant of leverage, with its effect concentrated among firms that face higher financing frictions (firms that are small, unrated, and pay low dividends). Those estimates also imply that the types of tangible assets that are less suitable to resolve financing frictions (e.g., machinery and equipment) are also economically and statistically less relevant in explaining leverage. The results in Table 7 are consistent with the notion that the effect of asset tangibility on capital structure operates through its ability to ameliorate contracting frictions between lenders and borrowers: tangible assets allow for more credit conditional on their redeployability.

4.2 Macroeconomic Movements and Leverage

We now focus on the role of asset tangibility in explaining capital structure when credit frictions shift exogenously as a result of macroeconomic shocks. According to Bernanke and Gertler (1995), examining firm financing patterns over the business cycle is important because during those times credit frictions become more acute (e.g., agency problems are heightened). During contractions, tangibility may more significantly affect the availability of external finance for firms that are most affected by credit constraints. To isolate the constraint-mitigating effect of tangibility during a contraction, one needs to control for a possible shift in the demand for credit (firms demand less credit when business fundamentals are weak). If, as we have argued, tangible assets are first-order drivers of leverage because they ease borrowing through a collateral channel, then the redeployability–leverage relation should strengthen during credit contractions, controlling for real activity. We implement a test of this type in this section.

A number of empirical studies have used economy-wide shocks to study firms’ leverage decisions (e.g., Korajczyk and Levy (2003)), liquidity management (Almeida et al. (2004)), and inventory behavior (Carpenter et al. (1994)). While these papers have not examined the role of tangible assets in driving capital structure over the business cycle, we build on their approach to examine that association. Here, we follow the two-step procedure used by Almeida et al., which borrow this testing strategy from Kashyap and Stein (2000).

The first step of the procedure consists of estimating the baseline regression model (Eq. (2)) every year for our sample period. From each sequence of cross-sectional regressions, we collect the coefficients returned for *Land&Building* (i.e., α_1) and ‘stack’ them into the vector Ψ_t , which

is then used as the dependent variable in the following (second stage) time-series regression:

$$\Psi_t = \eta + \sum_{j=1}^3 \phi_j \Delta Credit_{t-j} + \rho Trend_t + u_t, \quad (3)$$

where the term $\Delta Credit$ represents innovations to credit supply. We proxy for $\Delta Credit$ using changes in the Fed funds rate (*Fed Funds*). The impact of shocks to credit supply on the sensitivity of *MarketLeverage* to *Land&Building* is gauged from the sum of the coefficients ϕ 's on the three lags of the *Fed Funds* variable.¹⁷ A time trend (*Trend*) is included to capture secular changes in capital structure. To control for innovations in the demand for credit, in multivariate versions of Eq. (3), we include respectively the natural log of GDP and both the natural log of GDP and consumer expenditures.¹⁸ These regressions are estimated with Newey-West consistent standard errors, which are robust to heteroskedasticity (Newey and West (1987)).

The results from the second step estimation are reported in Table 8. The evidence in the table suggests that the role of land and buildings as a first-order determinant of leverage becomes noticeably more important during credit contractions. Using the univariate model from the full sample as an example (Panel A), the positive estimate for the *Fed Funds* variable (i.e., the sum of the coefficients for the three lags of the *Fed Funds*) implies that the coefficient on *Land&Building* increases by 0.191 when the Fed funds rate increases by 100 basis points. This is a significant shift given that the *Land&Building* coefficient equals 0.486 in the first-stage IV.

The evidence in Panel B and C shows that our conclusions hold after we control for shifts in the demand for credit using GDP (Panel B) and both GDP and consumer expenditures (Panel C). The results in Table 8 also show that the increased sensitivity of *MarketLeverage* to *Land&Building* is especially strong for firms in the high financing friction partitions. In particular, the coefficient on the *Fed Funds* is positive and highly statistically significant for the small, unrated, and low payout firms. In contrast, the same macro variable attracts coefficients that are very small in magnitude and statistically insignificant for large and unrated firms. High payout firms are an apparent exception in that the coefficient on the *Fed Funds* variable is positively significant in this case, but its magnitude is small and its effect disappears after controlling for innovations in the demand for credit (Panels B and C).

TABLE 8 ABOUT HERE

The estimates in Table 8 add to prior evidence in the paper pointing to the redeployability of tangible assets as a feature that facilitates borrowing by firms that are likely to be credit

¹⁷Although Ψ_t is a generated regressand, coefficient estimates for Eq. (3) are consistent (cf. Pagan (1984)).

¹⁸These series are obtained from the Bureau of Labor Statistics.

constrained (small, unrated, and low payout firms) during times when credit constraints bind the most (aggregate credit contractions). In all, they help substantiate the argument that credit supply effects play an important role in the time-series and cross-sectional variation of leverage ratios.

5 Comparisons with Recent Studies

The analysis thus far uses standard leverage models so as to facilitate comparisons with the broader capital structure literature. However, our priors on the relation between tangibility and leverage are not necessarily model-specific. They should appear in empirical specifications used in papers that are more closely related to ours. We experiment with this idea in turn. First, we replicate Faulkender and Petersen’s (2006) study, introducing our asset tangibility decomposition in their model. Within those authors’ test setting, we assess the economic effect of asset tangibility and compare it with their proposed credit ratings proxy. We then consider Lemmon et al.’s (2008) leverage regression analysis. Lemmon et al. find that the economic importance of traditional drivers of leverage nearly disappears when one accounts for firm-specific, time-invariant effects. Accordingly, we subject our tangibility proxies to a similar experiment, using those authors’ model.

5.1 Asset Tangibility and Credit Ratings

Faulkender and Petersen (2006) hypothesize that access to the public debt markets might mitigate credit rationing, allowing firms to increase their leverage. Using credit ratings as a proxy for access to those markets, the authors find a significant impact of ratings on leverage. In particular, evidence in Table 5 of their paper shows that a ratings dummy increases a firm’s market leverage ratio by 0.051 (see column 3). Relative to the average market leverage ratio of 0.222 that the authors report in their Table 1, this corresponds to an increase in leverage of 22.9% relative to the sample mean. The authors report that leverage increases range from 0.057 to 0.063 in instrumental variable models that tackle the endogeneity of ratings (see their Table 8). These numbers correspond to an increase in leverage in the order of 25.7% to 28.4% relative to the sample average leverage.

We use our sample to replicate the tests of Faulkender and Petersen (2006); see, e.g., Table 4 in their paper. In columns 1 and 2 of Table 9 below, we report OLS and IV results for our restricted model. In column 3, we report IV results for the unrestricted model. Notably, the results reported in Table 9 are very similar to those in Faulkender and Petersen. Focusing on the rating dummy (their key variable), column 3 shows that access to the public debt market

increases leverage by 0.045. Relative to the average market leverage of 0.202, this corresponds to an increase in leverage in percentage terms relative to the sample mean of 22.1%, which closely resembles the 22.9% estimate of Faulkender and Petersen.

TABLE 9 ABOUT HERE

Once we replicate their findings, our main task is to gauge the relative economic importance of our measures of tangibility and Faulkender and Petersen’s rating dummy. Table 9 reports, in square brackets, the percentage change in leverage relative to its sample mean as each variable increase from the 10th to the 90th percentile while all the other variables are kept at their mean.¹⁹ The only exception is the rating dummy, which should be interpreted as the percentage change in leverage relative to its sample mean for firms with a credit rating relative to those without one.

The estimates of Table 9 imply that asset tangibility is the main driver of leverage in Faulkender and Petersen’s regression model. One finds, for example, that as *Land&Building* increases from the 10th to the 90th percentile, leverage increases by 0.098. Relative to the sample mean leverage of 0.202, this corresponds to an increase of 48.5%. This is about twice as large as the increase in leverage that is associated with the rating dummy (i.e., 22.1%), or what the authors find for their best performing IV regression (28.4%). Similar economic magnitudes are associated with the more standard measure of asset tangibility, *OverallTangibility* (see column 2). This is an interesting finding since both our main arguments and Faulkender and Petersen’s central story revolve around supply-side determinants of capital structure. The more substantive contribution of our findings relative to theirs is that, rather than using a broadly-defined measure of access to credit, we identify a specific channel through which creditworthiness affects capital structure. Overall, our results add to those of Faulkender and Petersen in characterizing the supply-side determinants of observed leverage dispersion.

5.2 Asset Tangibility and Firm Effects in Leverage Regressions

Lemmon et al. (2008) show that most of the empirical variation in leverage can be explained by unobserved, time-invariant firm effects. On this basis, the authors argue that capital structure models estimated via OLS might overestimate the marginal effects of the traditional determinants of leverage. Consistently, they report that coefficient estimates for the traditional determinants of market leverage drop on average by about 60% after accounting for firm-fixed

¹⁹We use the 10th–90th percentile change for continuous variables in the tests of this section so as to resemble the impact of a dummy variable (similar to Faulkender and Petersen’s credit rating dummy).

effects. Their paper gives a “dim picture” (p. 1605) of existing models’ ability to explain capital structure.

We replicate the results reported in Table V of Lemmon et al. for our sample. The results are reported in Table 10. Comparing OLS estimates in column 1 and 3 with those of the firm-fixed effects IV specifications in columns 2 and 4, we find a clear pattern of decline in the size of the coefficients attracted by traditional determinants of leverage, similar to the pattern reported by Lemmon et al.²⁰ The coefficients associated with our main tangibility proxies are noticeable exceptions, however. For *OverallTangibility*, a comparison of results across columns 1 and 2 shows an *increase* in the magnitude of the coefficient from 0.157 to 0.295. In economic terms, this implies that a one-standard deviation increase in *OverallTangibility* makes leverage increase by 24.0% from its mean, compared to 12.8% in the OLS specification. Notably, we find a much sharper increase if we compare the coefficient estimates for *Land&Building* across columns 3 and 4 (unrestricted model). In this case, the tangibility coefficient increases by a factor of almost 3 (from 0.163 in the OLS to 0.439 in the IV specification).

TABLE 10 ABOUT HERE

We also compare the economic effects of *Land&Building* and “initial leverage” (the firm’s leverage at the time it first appears in COMPUSTAT). This is an interesting comparison in that Lemmon et al. find that initial leverage is one of the main predictors of capital structure. We start by replicating Table II (full model) of Lemmon et al. In this test, we emulate the impact of firm-fixed effects by subtracting firm-centered averages of all variables except initial leverage (which is fixed within the firm). Results are reported in column 5 of Table 10. Our estimates imply that a one-standard deviation increase in initial leverage causes leverage to increase by 0.07. Relative to our sample mean for leverage, this change corresponds to an increase of about 34%. This result is consistent with the evidence in Lemmon et al., who report in Table II (column 6) of their paper that a one-standard deviation increase in initial leverage causes leverage to increase by 0.07. More importantly, a comparison of the results across column 4 and 5 shows that the coefficient of *Land&Building* strengthens in the model with initial leverage. As it turns out, the economic impact of *Land&Building* is sizable and comparable to the effect of initial leverage. In particular, we find that a one-standard deviation increase in *Land&Building* causes leverage to increase by about 0.06. Relative to the sample mean, this figure implies an increase in leverage of 27%.

The tests of this section show that, unlike traditional determinants of leverage, our measures of asset tangibility *strengthen* after controlling for firm-fixed effects. Differently put, they

²⁰As in Lemmon et al., one exception to this pattern is the estimate associated with *Log(Sales)*.

pass the “fixed effects stress test” proposed by Lemmon et al. (2008). These results highlight the importance and robustness of the redeployability–leverage channel we propose.

6 Conclusions

Understanding the role of collateral in borrowing is important because of its implications for corporate financing. In the presence of contracting frictions, assets that are tangible are more desirable from the point of view of creditors because they are easier to repossess in bankruptcy states. Tangible assets, however, often lose value in liquidation states. It is thus unclear whether and how they affect a firm’s debt capacity.

The results of this paper suggest that the redeployable component of tangible assets drives observed leverage ratios. Furthermore, across the various categories of tangible assets, it is land and buildings — presumably, the least firm-specific assets — that have the most explanatory power over leverage. The evidence we present implies that financing frictions are key determinants of capital structure. While prior literature has considered the notion that these financing imperfections are potentially relevant, we show that they have first-order effects on leverage.

Our analysis sheds additional light on the effect of credit market imperfections on leverage by comparing firms that are more likely to face financing frictions (small, unrated, and low dividend firms) and firms that are less likely to face those frictions (large, rated, and high payout firms). We find that our redeployability–leverage results are pronounced across the first set of firms. In contrast, for unconstrained firms, redeployability does not explain leverage. These firm-type contrasts are consistent with the financing friction argument: variation in asset redeployability only affects the credit access of those firms that are credit-constrained. Additional tests show that redeployability facilitates borrowing the most when credit availability is scarce.

Our paper uniquely identifies a well-defined channel — the redeployability of tangible assets — to characterize the impact of credit frictions on leverage. We believe future research should more carefully consider trade-offs between credit constraints, credit supply, and firms’ demand for debt financing. It should do so emphasizing concrete aspects (and frictions) of real-world financial contracts. More generally, this strategy can also be useful for research focusing on the interplay between access to collateral, corporate financing, and investment. For example, our redeployability-based measure is general enough to help understand how contracting frictions might hinder the borrowing and investment of small businesses, private firms, and start-ups.

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Table 1 – Sample Descriptive Statistics

This table reports summary statistics for the main variables used in the paper’s empirical estimations. All firm level data, with the exception of the marginal tax rate, are obtained from COMPUSTAT industrial tapes over the sample period 1984-1996. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. *MarketLeverage* is the ratio of total debt (COMPUSTAT’s items *dltt + dlc*) to market value of total assets, or $(at - ceq + prcc_fcshpri)$. *BookLeverage* is the ratio of total debt to book value of total assets (*at*). *OverallTangibility* is the ratio of total tangible assets (*ppent*) to book value of total assets. *Land&Building* is the ratio of net book value of land and building (*ppenli + ppenb*) to the book value of total assets. *Machinery&Equipment* is the ratio of net book value of machinery and equipment (*ppenme*) to book value of total assets. *OtherTangibles* is the ratio of plant and equipment in progress and miscellaneous tangible assets (*ppenc + ppeno*) to book value of total assets. *Size* is the natural logarithm of the market value of total assets (measured in millions of 1996 dollars using the Producer Price Index (PPI) published by the U.S. Department of Labor as the deflator). *Profitability* is the ratio of earnings before interest, taxes, depreciation and amortization (*oibdp*) to book value of total assets. *Q* is the ratio of market value of total assets to book value of total assets. *EarningsVolatility* is the ratio of the standard deviation of earnings before interest, taxes, depreciation and amortization using four years of consecutive observations to the average book value of total assets estimated over the same time horizon. *MarginalTaxRate* is Graham’s marginal tax rate. *RatingDummy* is a dummy variable that takes a value of 1 if the firm has either a bond rating (*splticrm*) or a commercial paper rating (*spsticrm*) and zero otherwise.

Variables	Sample Statistics					
	Mean	Median	St. Dev.	25th Pct.	75th Pct.	Obs.
<i>MarketLeverage</i>	0.202	0.163	0.175	0.056	0.307	10,151
<i>BookLeverage</i>	0.257	0.227	0.223	0.094	0.367	10,151
<i>OverallTangibility</i>	0.356	0.327	0.175	0.244	0.452	10,034
<i>Land&Building</i>	0.118	0.102	0.113	0.035	0.162	10,034
<i>Machinery&Equipment</i>	0.189	0.161	0.129	0.104	0.237	10,034
<i>OtherTangibles</i>	0.015	0.000	0.043	0.000	0.014	10,034
<i>Size</i>	5.033	4.853	1.946	3.615	6.249	10,151
<i>Profitability</i>	0.106	0.133	0.170	0.067	0.187	10,151
<i>Q</i>	1.625	1.298	1.064	1.026	1.812	10,151
<i>EarningsVolatility</i>	0.091	0.067	0.089	0.042	0.110	10,095
<i>MarginalTaxRate</i>	0.320	0.340	0.104	0.296	0.359	10,151
<i>RatingDummy</i>	0.164	0.000	0.370	0.000	0.000	10,151

Table 2 – Standard Leverage Regressions

This table reports regression results for OLS with fixed effects (OLS-FE) estimations of the restricted model (Eq. (1) in the text) for both our sample and an extended COMPUSTAT sample (ranging from 1971-2006). Estimations also include year dummies. All firm level data are from COMPUSTAT industrial tapes. Refer to Table 1 for detailed variable definitions. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Standard errors reported in parentheses are based on heteroskedastic consistent errors adjusted for clustering across observations of a given firm (Rogers, 1993).

	Market Leverage		Book Leverage	
	1984-1996	1971-2006	1984-1996	1971-2006
<i>OverallTangibility</i>	0.210*** (0.028)	0.220*** (0.011)	0.228*** (0.038)	0.241*** (0.014)
<i>Size</i>	0.015 (0.006)	0.017*** (0.002)	0.016 (0.014)	0.020*** (0.003)
<i>Profitability</i>	-0.116*** (0.019)	-0.160*** (0.008)	-0.122*** (0.039)	-0.204*** (0.015)
<i>Q</i>	-0.047*** (0.004)	-0.045*** (0.001)	-0.013* (0.007)	0.000 (0.003)
<i>EarningsVolatility</i>	-0.026 (0.064)	0.000 (0.017)	-0.201 (0.280)	0.020 (0.032)
<i>MarginalTaxRate</i>	-0.168*** (0.026)	-0.182*** (0.010)	-0.216*** (0.035)	-0.211*** (0.015)
<i>RatingDummy</i>	0.042*** (0.008)	0.039*** (0.003)	0.068*** (0.013)	0.061*** (0.004)
<i>Obs.</i>	9,765	95,602	9,765	95,602
<i>Adj.-R²</i>	0.213	0.208	0.090	0.088

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 3 – Leverage by Tangibility Quartiles

This table reports mean comparisons of the leverage ratio for sub-sample of firms in the top and bottom quartiles of *OverallTangibility*, *Land&Building*, *Machinery&Equipment*, and *OtherTangibles*. Refer to Table 1 for detailed variable definitions. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms.

Panel A: Market Leverage			
	Top Quartile	Bottom Quartile	Difference Top – Bottom
By <i>OverallTangibility</i>	0.240	0.160	0.080***
By <i>Land&Building</i>	0.233	0.175	0.058***
By <i>Machinery&Equipment</i>	0.227	0.189	0.038***
By <i>OtherTangibles</i>	0.188	0.202	-0.014***

Panel B: Book Leverage			
	Top Quartile	Bottom Quartile	Difference Top – Bottom
By <i>OverallTangibility</i>	0.300	0.214	0.086***
By <i>Land&Building</i>	0.290	0.246	0.044***
By <i>Machinery&Equipment</i>	0.287	0.239	0.048***
By <i>OtherTangibles</i>	0.250	0.256	-0.006

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table 4 – First Stage of IV Regressions

This table reports the first stage of instrumental variable regressions for *OverallTangibility* (Restricted Model) and Tangibility: *Land&Building*, *Machinery&Equipment*, and *OtherTangibles* (Unrestricted Model). We only tabulate coefficients on excluded instruments in the interest of space. Estimations also include firm- and year-fixed effects. All firm level data are from COMPUSTAT industrial tapes. Instrumental variables are obtained from several sources and are described in detail in the text. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Standard errors reported in parentheses are based on heteroskedastic consistent errors adjusted for clustering within firm.

	Restricted Model	Unrestricted Model		
	Overall Tangibility	Land & Building	Machinery & Equipment	Other
Panel A: Industry Characteristics				
<i>Overall Tangibility - Industry Mean</i>	0.551*** (0.032)			
<i>Land&Building - Industry Mean</i>		0.427*** (0.049)	0.088*** (0.034)	-0.040* (0.023)
<i>Machinery&Equipment - Industry Mean</i>		0.011 (0.024)	0.436*** (0.048)	0.009 (0.009)
<i>OtherTangibles - Industry Mean</i>		-0.225* (0.129)	-0.109 (0.076)	0.707*** (0.154)
Panel B: Real Estate Supply & Market Conditions				
<i>LeasingExpenses</i>	-0.395*** (0.141)	-0.288*** (0.077)	-0.130 (0.115)	-0.012 (0.020)
<i>Num. of REITs & Other RE Operators</i>	-0.015*** (0.005)	-0.008** (0.004)	-0.008* (0.004)	-0.002 (0.002)
<i>HHI Banks</i>	0.017 (0.011)	0.012* (0.007)	0.000 (0.009)	0.005 (0.003)
<i>RentalVolatility</i>	0.002*** (0.001)	0.001*** (0.000)	0.002*** (0.001)	0.000 (0.000)
Panel C: Machinery&Equipment Structure & Secondary Market				
<i>NumberEmployees</i>	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.000 (0.000)
<i>IndustryResale</i>	-0.018* (0.010)	-0.006 (0.006)	-0.022*** (0.008)	-0.001 (0.003)
<i>Obs.</i>	8,645	8,645	8,645	8,645
Shea's Partial R^2 (Excluded Instruments)	0.158	0.056	0.079	0.074
Standard F -test (Excluded Instruments)	65.11***	11.15***	27.51***	4.77***
Kleibergen-Paap's Statistic	65.11		10.94	
Hansen's J -Statistic - P -Value	0.316		0.456	

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 5 – Second Stage Regression Estimates – Restricted Model

This table reports second stage regression results for fixed effects instrumental variables (IV) estimations of the restricted model (Eq. (1) in the text). Estimations also include year dummies. The figures in square brackets reported under the standard errors represent the percentage changes [%] in leverage relative to its sample mean as each continuous regressor increases from the 25th to the 75th percentile, while all other regressors are kept at their sample mean. The exception is *RatingDummy*, for which we report the raw regression coefficient. For example, as *OverallTangibility* increases from its 25th to its 75th percentile, market leverage increases by 0.051, which is a 25% increase relative to the sample mean leverage of 0.202. All firm level data are from COMPUSTAT industrial tapes. Refer to Table 1 for detailed variable definitions. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Standard errors reported in parentheses are based on heteroskedastic consistent errors adjusted for clustering across observations of a given firm (Rogers, 1993).

	Market Leverage	Book Leverage
<i>OverallTangibility</i>	0.251*** (0.055) [25.34]	0.190*** (0.073) [15.15]
<i>Size</i>	0.004 (0.006) [5.24]	0.014 (0.015) [14.03]
<i>Profitability</i>	-0.115*** (0.020) [-6.56]	-0.118*** (0.040) [-5.30]
<i>Q</i>	-0.047*** (0.004) [-17.78]	-0.014** (0.007) [-4.27]
<i>EarningsVolatility</i>	-0.024 (0.067) [-0.79]	-0.231 (0.296) [-5.98]
<i>MarginalTaxRate</i>	-0.158*** (0.027) [-4.26]	-0.211*** (0.037) [-4.46]
<i>RatingDummy</i>	0.044*** (0.009) [0.04]	0.069*** (0.013) [0.07]
<i>Obs.</i>	8,645	8,645
<i>Adj.-R²</i>	0.214	0.088

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 6 – Economic Significance (Unrestricted Model) – Interquartile Change

This table reports regression results for standard OLS, firm fixed effects least squares (FE), and fixed effects instrumental variables (IV) estimations of the unrestricted model (Eq. (2) in the text). Estimations also include year dummies. Results are displayed in terms of percentage changes in leverage relative to its sample mean as each continuous regressor increases from the 25th to the 75th percentile, while all other regressors are kept at their mean. The exception is the *Rating Dummy*, for which we report the raw regression coefficient. All firm level data are from COMPUSTAT industrial tapes. Refer to Table 1 for detailed variable definitions. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms.

	Market Leverage			Book Leverage		
	% Change in Response to IQR Shock			% Change in Response to IQR Shock		
	OLS (1)	FE (2)	IV (3)	OLS (4)	FE (5)	IV (6)
<i>Land&Building</i>	13.14***	19.21***	30.28***	13.22***	17.21***	20.12**
<i>Machinery&Equipment</i>	12.03***	8.86***	9.51	11.94***	5.34*	0.61
<i>OtherTangibles</i>	0.48	0.99**	2.85**	0.55	0.75*	1.27
<i>Size</i>	-11.53***	6.32	3.70	-6.14**	15.60	13.95
<i>Profitability</i>	-6.62***	-7.13***	-6.64***	-8.08***	-5.97***	-5.54***
<i>Q</i>	-22.76***	-18.22***	-17.01***	-3.44*	-3.74*	-3.80*
<i>EarningsVolatility</i>	-5.32***	-0.80	-0.60	-2.72*	-5.34	-5.86
<i>MarginalTaxRate</i>	-6.45***	-5.03***	-4.25***	-7.59***	-5.10***	-4.51***
<i>RatingDummy</i>	0.06***	0.04***	0.04***	0.10***	0.07***	0.07***
<i>Obs.</i>	9,765	9,765	8,645	9,765	9,765	8,645
<i>Adj.-R²</i>	0.230	0.213	0.204	0.102	0.089	0.086

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 7 - Economic Significance: Low/High Credit Market Frictions – Interquartile Change

This table reports second stage regression results for fixed effects instrumental variables (IV) estimations of the unrestricted model (Eq. (2) in the text). Estimations also include year dummies. Results are displayed in terms of percentage changes in leverage relative to its sample mean as each continuous regressor increases from the 25th to the 75th percentile, while all other regressors are kept at their mean. The exception is the *Rating Dummy*, for which we report the raw regression coefficient. All firm level data are from COMPUSTAT industrial tapes. Refer to Table 1 for detailed variable definitions. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Small (Large) Firms are firms in the bottom (top) 3 deciles of the annual sample size distribution. Unrated (Rated) Firms are firms without (with) a debt rating and positive leverage. Low (High) DivPayout firms are firms in the bottom (top) 3 deciles of the annual sample payout distribution.

Panel A: Market Leverage % Change in Response to IQR Shock	Full	Size		Ratings		Div. Payout	
	Sample	Small	Large	Unrated	Rated	Low	High
	(1)	Firms	Firms	Firms	Firms	DivPayout	DivPayout
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Land&Building</i>	30.28***	41.23***	1.27	39.72***	-10.47	37.35***	-16.83
<i>Machinery&Equipment</i>	9.51	12.55	3.03	10.87	3.48	13.26	-0.91
<i>OtherTangibles</i>	2.85**	0.71	-4.02	2.46**	-0.03	0.00	-9.24
<i>Size</i>	3.70	-12.89**	-14.35	-5.13	-20.54	-5.40	-18.39***
<i>Profitability</i>	-6.64***	-4.65***	-15.85***	-5.96***	-15.23***	-4.19**	29.92
<i>Q</i>	17.01***	-11.85***	-9.90***	-16.17***	-15.97***	-16.35***	-21.40***
<i>EarningsVolatility</i>	-0.60	-3.46	-1.13	0.37	-2.46	-1.15	-1.42
<i>MarginalTaxRate</i>	-4.25***	-16.62***	0.56	-5.09***	-0.24	-12.06***	-1.49
<i>Rating Dummy</i>	0.04***		0.04***			0.04	10.42
<i>Obs.</i>	8,645	2,404	2,549	6,463	1,373	3,448	2,476
<i>Adj.-R²</i>	0.204	0.251	0.186	0.205	0.265	0.190	0.110

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Panel B: Book Leverage % Change in Response to IQR Shock	Full Sample	Size		Ratings		Div. Payout	
		Small Firms (1)	Large Firms (2)	Unrated Firms (3)	Rated Firms (4)	Low DivPayout (5)	High DivPayout (6)
		<i>Land&Building</i>	20.12**	28.94*	-18.66	26.12**	-14.66
<i>Machinery&Equipment</i>	0.61	5.83	-5.73	-0.77	1.94	-0.87	-12.01
<i>OtherTangibles</i>	1.27	0.98	-1.89	0.69	6.22	0.89	-7.85
<i>Size</i>	13.95	-6.77	1.29	5.83	2.44	-3.65	-12.38***
<i>Profitability</i>	-5.54***	-4.81	-7.62*	-5.65***	-6.89**	-4.38	76.76***
<i>Q</i>	-3.80*	1.98	-3.16	-2.04	-2.70	-0.85	-12.46***
<i>EarningsVolatility</i>	-5.86	-8.41	0.36	-7.99	-2.71	-11.39	-1.02
<i>MarginalTaxRate</i>	-4.51***	-15.82***	-1.31	-5.52***	-1.03	-12.81***	-2.32
<i>RatingDummy</i>	0.07***		0.07***			20.18	14.50**
<i>Obs.</i>	8,645	2,404	2,549	6,463	1,373	3,448	2,476
<i>Adj.-R²</i>	0.086	0.110	0.084	0.067	0.035	0.057	0.037

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 8 – Macroeconomic Effects: The Impact of Land&Building on Leverage during Credit Contractions

The dependent variable is the annual series of the estimated coefficients on *Land&Building* from the fixed effects instrumental variable regression (IV) with market leverage (Eq. (3) in the text). In Panel A, the dependent variable is regressed on the 3 lags of the *Fed Funds* (only sum of coefficients tabulated). In Panel B, the dependent variable is regressed on the 3 lags of the *Fed Funds* (only sum of coefficients tabulated) and *GDP* (omitted). In Panel C, the dependent variable is regressed on the 3 lags of the *Fed Funds* (only sum of coefficients tabulated) *GDP* (omitted), and *Consumer Expenditures* (omitted). All regressions include a constant and a trend variable (omitted). The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Newey-West consistent standard errors with 4 lags and robust to heteroskedasticity are reported in parentheses.

	Full Sample	Size		Ratings		Div. Payout	
		Small Firms	Large Firms	Unrated Firms	Rated Firms	Low DivPayout	High DivPayout
ΔCredit							
Panel A: Univariate							
<i>Fed Funds</i>	0.191** (0.063)	0.478** (0.168)	0.018 (0.068)	0.250*** (0.048)	-0.035 (0.093)	0.246*** (0.051)	0.092** (0.022)
Panel B: Bivariate							
<i>Fed Funds</i>	0.180** (0.048)	0.449* (0.148)	0.004 (0.109)	0.233*** (0.037)	-0.023 (0.104)	0.273*** (0.035)	0.0216 (0.063)
Panel C: Multivariate							
<i>Fed Funds</i>	0.190* (0.054)	0.302* (0.106)	0.024 (0.076)	0.240** (0.042)	0.001 (0.063)	0.281** (0.045)	0.021 (0.077)

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 9 – Asset Tangibility and the Rating Dummy

This table reports results from replicating the basic regression model in Faulkender and Petersen (2006) for our sample based on OLS and fixed effects instrumental variable estimations (IV) for both our restricted and unrestricted models. Estimations also include year dummies. The dependent variable is market leverage. We follow Faulkender and Petersen (2006) in defining variables and model specifications but in Column 3 we use our *Land&Building*, *Machinery&Equipment* and *OtherTangibles* instead of the traditional tangibility proxy. All firm level data are from COMPUSTAT industrial tapes. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Standard errors reported in parentheses are based on heteroskedastic consistent errors adjusted for clustering across observations of a given firm (Rogers, 1993). To resemble closely the impact of a dummy variable, the figures in square brackets reported under the standard errors represent the percentage changes in leverage relative to its sample mean as each continuous regressor increases from the 10th to the 90th percentile, while all other regressors are kept at their sample mean.

	Restricted Model		Unrestricted Model
	OLS (1)	IV (2)	IV (3)
<i>OverallTangibility</i>	0.189*** (0.024) [40.67%]	0.262*** (0.070) [56.52%]	
<i>Land&Building</i>			0.393*** (0.125) [48.46%]
<i>Machinery&Equipment</i>			0.191* (0.100) [25.68%]
<i>OtherTangibles</i>			0.357* (0.187) [7.28%]
<i>Firm has a debt rating</i>	0.069*** (0.010) [34.00%]	0.047*** (0.009) [23.07%]	0.045*** (0.009) [22.06%]
<i>Ln(market assets)</i>	-0.007*** (0.002) [-18.53%]	0.001 (0.006) [2.45%]	-0.000 (0.006) [-0.02%]
<i>Ln(1 + firm age)</i>	-0.006 (0.007) [-2.64%]	0.066** (0.027) [26.89%]	0.059** (0.027) [23.9%]
<i>Market-to-book</i>	-0.065*** (0.003) [-57.74%]	-0.048*** (0.004) [-42.93%]	-0.047*** (0.004) [-41.87%]
<i>R&D/sales</i>	-0.049** (0.021) [-2.27%]	-0.013 (0.013) [-0.61%]	-0.013 (0.013) [-0.60%]
<i>Advertising/sales</i>	-0.139* (0.076) [-2.97%]	-0.225 (0.161) [-4.80%]	-0.214 (0.163) [-4.56%]
<i>Profits/sales</i>	-0.030* (0.016) [-3.44%]	-0.009 (0.010) [-0.96%]	-0.008 (0.010) [-0.88%]
<i>Marginal Tax Rate</i>	-0.274*** (0.036) [-39.28%]	-0.216*** (0.026) [-30.97%]	-0.218*** (0.027) [-31.23%]
<i>Obs.</i>	8,638	8,638	8,638
<i>Adj.-R²</i>	0.235	0.206	0.200

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.

Table 10 – Asset Tangibility and Firm Fixed-Effects

This table reports results from replicating Table V in Lemmon et al. (2008) for our sample based on OLS and fixed effects instrumental variable estimations (IV) for both our restricted and unrestricted models. Estimations also include year dummies. The dependent variable is market leverage. We follow Lemmon, Roberts, and Zender (2008) in defining variables and model specifications but in Columns 3, 4 and 5 we use our *Land&Building*, *Machinery&Equipment* and *OtherTangibles* instead of the traditional tangibility proxy. All firm level data are from COMPUSTAT industrial tapes. The sample includes all firms except, financial, lease, REIT and real estate-related, non-profit, and governmental firms. Standard errors reported in parentheses are based on heteroskedastic consistent errors adjusted for clustering across observations of a given firm (Rogers, 1993). The figures in square brackets reported under the standard errors represent the percentage changes in leverage relative to its sample mean as each continuous regressor increases 1 standard deviation, while all other regressors are kept at their sample mean.

	Restricted Model		Unrestricted Model		
	OLS (1)	IV (2)	OLS (3)	IV (4)	IV (5)
<i>OverallTangibility</i>	0.157*** (0.030) [12.75%]	0.295*** (0.104) [23.98%]			
<i>Land&Building</i>			0.163*** (0.043) [8.94%]	0.439** (0.191) [24.13%]	0.489*** (0.188) [26.91%]
<i>Machinery&Equipment</i>			0.131*** (0.044) [7.68%]	0.183 (0.151) [10.74%]	0.010 (0.162) [0.59%]
<i>OtherTangibles</i>			0.161* (0.094) [2.87%]	0.759*** (0.240) [13.50%]	0.727*** (0.250) [12.93%]
<i>InitialLeverage</i>					0.461*** (0.033) [34.34%]
<i>Log(Sales)</i>	0.003 (0.003) [2.98%]	0.024*** (0.009) [22.07%]	0.004 (0.003) [3.50%]	0.024*** (0.009) [22.10%]	0.042*** (0.009) [38.76%]
<i>Market-to-book</i>	-0.058*** (0.004) [-25.95%]	-0.026*** (0.003) [-11.50%]	-0.058*** (0.004) [-25.58%]	-0.026*** (0.004) [-11.36%]	-0.026*** (0.004) [-11.36%]
<i>Profitability</i>	-0.057** (0.027) [-5.64%]	-0.035* (0.021) [-3.50%]	-0.057** (0.028) [-5.67%]	-0.036* (0.021) [-3.57%]	-0.049** (0.024) [-4.85%]
<i>Indus. med. lev.</i>	0.248*** (0.042) [11.94%]	0.046* (0.028) [2.24%]	0.256*** (0.042) [12.35%]	0.056** (0.029) [2.70%]	0.052* (0.031) [2.51%]
<i>Cash flow vol.</i>	-0.108 (0.074) [-3.63%]	0.063 (0.076) [2.10%]	-0.100 (0.076) [-3.36%]	0.069 (0.076) [2.32%]	0.085 (0.081) [2.86%]
<i>Dividend payer</i>	-0.078*** (0.010) [-37.62%]	-0.014* (0.008) [-6.66%]	-0.083*** (0.010) [-40.00%]	-0.014* (0.008) [-6.56%]	-0.057 (0.008) [-27.36%]
<i>Obs.</i>	5,902	5,902	5,902	5,902	5,902
<i>Adj.-R²</i>	0.221	0.106	0.216	0.103	0.105

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% (two-tail) test levels, respectively.